

**ABSTRACT**

Plasma etching processes using a plasma containing fluorine as well as bromine and/or iodine are suited for high aspect ratio etching of trenches, contact holes or other apertures in silicon oxide materials. The plasma is produced using at least one fluorine-containing source gas and at least one bromine- or iodine-containing source gas.

Bromine/iodine components of the plasma protect the aperture sidewalls from lateral attack by free fluorine, thus advantageously reducing a tendency for bowing of the sidewalls. Ion bombardment suppresses absorption of bromine/iodine components on the etch front, thus facilitating advancement of the etch front without significantly impacting taper.

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